

Application No. 10/702,207
Response to Office Action

Customer No. #1933

R E M A R K S

Reconsideration of this application, as amended, is respectfully requested.

RE: THE ALLOWABLE SUBJECT MATTER

The Examiner's allowance of claims 2-4 is respectfully acknowledged.

Claims 2-4 have been amended to make some minor grammatical improvements and to correct some minor antecedent basis problems so as to put them in better form for issuance in a U.S. patent.

No new matter has been added, and no new issues with respect to patentability have been raised. Accordingly, it is respectfully requested that the amendments to claims 2-4 be approved and entered.

It is respectfully submitted, moreover, that the amendments to claims 2-4 are not related to patentability, and do not narrow the scope of the claims either literally or under the doctrine of equivalents.

RE: THE AMENDMENTS TO CLAIM 1

Claim 1 has been amended to clarify the feature of the present invention whereby the regenerative motor is directly driven by return oil from the hydraulic actuators.

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In addition, claim 1 has been amended to make some minor grammatical improvements and to correct some minor antecedent basis problems so as to more clearly and positively recite the features of claim 1 and to put claim 1 in better form for issuance in a U.S. patent.

No new matter has been added, and it is respectfully requested that the amendments to claim 1 also be approved and entered.

RE: THE PRIOR ART REJECTION

Claim 1 was rejected under 35 USC 102 as being anticipated by USP 6,349,543 ("Lisniansky"). However, this rejection is respectfully traversed.

According to the claimed present invention as recited in amended claim 1, a hybrid power system for driving a hydraulic pump in construction equipment is provided in which an inflow of discharge oil from the hydraulic pump to hydraulic actuators is controlled to drive at least one working machine. As recited in amended claim 1, the power system comprises: an engine for driving the hydraulic pump, wherein the hydraulic pump being connected to the engine via a first power take-off; a regenerative motor which is directly driven by return oil from the hydraulic actuators, and which regenerates at least one of

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inertia energy and potential energy of the working machine to drive the hydraulic pump; and a generator motor for driving the hydraulic pump in combination with the engine, wherein the generator motor is driven as a generator by surplus torque when a regeneration torque of the regenerative motor is larger than a driving torque of the hydraulic pump, and wherein the generator motor is drivable as an electric motor to assist with driving the hydraulic pump. And according to the present invention as recited in amended claim 1, the regenerative motor and the generator motor are provided in parallel with the hydraulic pump via the first power take-off.

That is, according to the present invention as recited in amended claim 1, the regenerative motor is directly driven by return oil from the hydraulic actuators, such that at least one of inertia energy and potential energy of the working machine is regenerated to drive the hydraulic pump. Thus, the regenerated energy from the return oil from the hydraulic actuators is used to directly drive the regenerative motor to drive the hydraulic pump. In addition, if the regeneration torque is larger than a driving torque of the hydraulic pump, then the surplus torque is used to drive the generator motor as a generator.

As recognized by the Examiner, Lisniansky discloses that a driving torque of a shaft 98 is provided by an engine 100, a

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motor-generator 290 (when the motor-generator 290 is driven as a motor) and by a motor 300 (when the motor 300 is powered by a hydraulic accumulator 122). It is respectfully submitted, however, that the motor 300 of Lisniansky is not directly driven by the fluid discharged from the motor 1.

By contrast, it is respectfully submitted that according to Lisniansky, the hydraulic accumulator 122 is charged by discharged hydraulic fluid from the motor 1. According to Lisniansky, moreover, the shut-off valve 298 shuts off the hydraulic accumulator 122 from the motor 300 except under certain conditions, such as when the bus driven by motor 1 is accelerated (see column 40, lines 64 and 65 of Lisniansky). Thus, it is respectfully submitted that according to Lisniansky the motor 300 is not directly driven by return fluid from the motor 1 to drive the pump 90. Instead, it is respectfully submitted that according to Lisniansky the return fluid from the motor 1 is used to charge the hydraulic accumulator 122, and according to Lisniansky the hydraulic energy charged in the hydraulic accumulator 122 is used to drive the motor 300 under certain conditions.

Therefore, it is respectfully submitted that Lisniansky does not disclose, teach or suggest a regenerative motor which is directly driven by return oil from the hydraulic actuators, and

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which regenerates at least one of inertia energy and potential energy of the working machine to drive the hydraulic pump, as according to the present invention as recited in amended claim 1.

In view of the foregoing, it is respectfully submitted that the present invention as recited in amended claim 1 patentably distinguishes over Lisniansky, under 35 USC 102 as well as under 35 USC 103, along with allowed claims 2-4.

* * * * *

Entry of this Amendment, allowance of the claims, and the passing of this application to issue are respectfully solicited.

If the Examiner has any comments, questions, objections or recommendations, the Examiner is invited to telephone the undersigned for prompt action.

Respectfully submitted,



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